QC ABSTRACT

Nameof Work: Pothole filling to Roads in Ward No.11 Kuvempunagara Vidyaranyapura Sub Division, BBMP, Bangalore.

Sl. No.	Item	Quantity As Per BOQ	Required No's of testes	Actual No's of testes	Testes	Frequency
1	WMM	427.85Cum	-	-	-	-
		Gradation	3	3	-	-
		AIV	1	1	-	-
		Shape Test	1	1	-	-
		Atterberg Limits	3	3	-	-
2	BC	2852.31 Sqm	-	-	-	-
		Quality of Binder	1	1	-	-
		AIV	1	1	-	-
		Shape Test	1	1	-	-
		Gradation	1	1	-	-
		Specific Gravity	1	1	-	-
		Stability of Mix	1	1	-	
		Bitumen content	1	1		

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NABL Accredited As Per ISO/IEC 17025:2017 Laboratory

Job No.: CACE/BBMP/CP/W.No.11/2021-22 Date : 09.03.2022

GRADATION FOR WMM

Client : **Assistant Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.

Agency : **Sri. Chethan P,** Contractor, Bangalore.

Name of Work : Pothole filling to Roads in Ward No.11 Kuvempunagara Vidyaranyapura Sub Division, BBMP, Bangalore.

IS Code: : IS 2386 (Part 1):1963(RA 2011)

Date of Testing : 09.03.2022

Material Type : Wet Mix Macadam

Oven Dry.Wt, grar 10000

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Requirement as per MORTH 5th edition table no 400.13
53	0	0	0	100	100
45	189	189	1.9	98.1	95-100
22.4	2536	2725	27.3	72.8	60-80
11.2	2154	4879	48.8	51.2	40-60
4.75	1859	6738	67.4	32.6	25-40
2.36	1162	7900	79.0	21.0	15-30
0.600	589	8489	84.9	15.1	8-22
0.075	1215	9704	97.0	3.0	0-5

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GRADATION FOR WMM

Client : **Assistant Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.

Agency : **Sri. Chethan P,** Contractor, Bangalore.

Name of Work : Pothole filling to Roads in Ward No.11 Kuvempunagara Vidyaranyapura Sub Division, BBMP, Bangalore.

IS Code: : IS 2386 (Part 1):1963(RA 2011)

Date of Testing : 09.03.2022

Material Type : Wet Mix Macadam

Oven Dry.Wt, grar 10000

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Requirement as per MORTH 5th edition table no 400.13
53	0	0	0	100	100
45	198	198	2.0	98.0	95-100
22.4	2565	2763	27.6	72.4	60-80
11.2	2158	4921	49.2	50.8	40-60
4.75	1863	6784	67.8	32.2	25-40
2.36	1150	7934	79.3	20.7	15-30
0.600	548	8482	84.8	15.2	8-22
0.075	1268	9750	97.5	2.5	0-5

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Job No.: CACE/BBMP/CP/W.No.11/2021-22 Date : 09.03.2022

GRADATION FOR WMM

Client : **Assistant Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency : **Sri. Chethan P,** Contractor, Bangalore.
Name of Work : Pothole filling to Roads in Ward No.11 Kuvempunagara Vidyaranyapura Sub Division, BBMP, Bangalore.
IS Code: : IS 2386 (Part 1):1963(RA 2011)
Date of Testing : 09.03.2022
Material Type : Wet Mix Macadam

Oven Dry.Wt, grar 10000

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Requirement as per MORTH 5th edition table no 400.13
53	0	0	0	100	100
45	190	190	1.9	98.1	95-100
22.4	2530	2720	27.2	72.8	60-80
11.2	2158	4878	48.8	51.2	40-60
4.75	1865	6743	67.4	32.6	25-40
2.36	1150	7893	78.9	21.1	15-30
0.600	548	8441	84.4	15.6	8-22
0.075	1265	9706	97.1	2.9	0-5

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Job No.: CACE/BBMP/CP/W.No.11/2021-22 Date: 09.03.2022

Aggregate Impact Value

Client	**Assistant Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Sri. Chethan P,** Contractor, Bangalore.
Name of the Work	Pothole filling to Roads in Ward No.11 Kuvempunagara Vidyaranyapura Sub Division, BBMP, Bangalore.
IS Code	IS 2386 (Part 4):1963(RA 2011)
Type of Mix	Wet Mix macadam
Date of Testing	09.03.2022

Sl No.	Details	Test No. 1	Test No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	381	383	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	85	87	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	296	296	
4	Aggregate Impact value = percent fines 100* (W_2/W_1)%	22.31	22.72	22.51

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%(As per MORTH Specication table 400.12)

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Job No.: CACE/BBMP/CP/W.No.11/2021-22 Date : 09.03.2022

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	**Assistant Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Sri. Chethan P,** Contractor, Bangalore.
Name of Work	Pothole filling to Roads in Ward No.11 Kuvempunagara Vidyaranyapura Sub Division, BBMP, Bangalore.
BIS code:	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Date of Testing	09.03.2022

Sl no	Test	1	2	Requirements as per MORTH 5th edition table no 400.12
1	Flakiness Index %	11.50	11.90	Combined Flakiness & Elongation index Max 35%.
2	Elongation Index %	12.90	13.20	
	Combined Flakiness & Elongation index	24.40	25.10	

Note:

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Job No.: CACE/BBMP/CP/W.No.11/2021-22 Date : 11.03.2022

ATTERBERG LIMITS TEST FOR WMM

Client : **Assistant Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.

Agency : **Sri. Chethan P,** Contractor, Bangalore.

Name of Work : Pothole filling to Roads in Ward No.11 Kuvempunagara Vidyaranyapura Sub Division, BBMP, Bangalore.

IS Code: : IS 2720(Part 5):1985

Date of Testing : 09.03.2022 to 11.03.2022

Material Type : Wet Mix Macadam

Sl. No.	Particulars	Test Results	Requirement as per MORTH 5th edition Cl.406.2.1.2
1	Liquid Limit	19.00	-
2	Plasticity Index, %	Non Plastic	6.0% Maximum.

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Job No.: CACE/BBMP/CP/W.No.11/2021-22 Date : 11.03.2022

ATTERBERG LIMITS TEST FOR WMM

Client : **Assistant Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.

Agency : **Sri. Chethan P,** Contractor, Bangalore.

Name of Work : Pothole filling to Roads in Ward No.11 Kuvempunagara Vidyaranyapura Sub Division, BBMP, Bangalore.

IS Code: : IS 2720(Part 5):1985

Date of Testing : 09.03.2022 to 11.03.2022

Material Type : Wet Mix Macadam

Sl. No.	Particulars	Test Results	Requirement as per MORTH 5th edition Cl.406.2.1.2
1	Liquid Limit	20.00	-
2	Plasticity Index, %	Non Plastic	6.0% Maximum.

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Job No.: CACE/BBMP/CP/W.No.11/2021-22 Date : 11.03.2022

ATTERBERG LIMITS TEST FOR WMM

Client : **Assistant Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.

Agency : **Sri. Chethan P,** Contractor, Bangalore.

Name of Work : Pothole filling to Roads in Ward No.11 Kuvempunagara Vidyaranyapura Sub Division, BBMP, Bangalore.

IS Code: : IS 2720(Part 5):1985

Date of Testing : 09.03.2022 to 11.03.2022

Material Type : Wet Mix Macadam

Sl. No.	Particulars	Test Results	Requirement as per MORTH 5th edition Cl.406.2.1.2
1	Liquid Limit	21.00	
2	Plasticity Index, %	Non Plastic	6.0% Maximum.

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Job No.: CACE/BBMP/CP/W.No.11/2021-22 Date : 17.03.2022

Aggregate Gradation Test
IS : 2386 Part I

Client	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	Sri. Chethan P, Contractor, Bangalore.
Name of the Work	Pothole filling to Roads in Ward No.11 Kuvempunagara Vidyaranyapura Sub Division, BBMP, Bangalore.
BIS Code	IS 2386(Part 1):1963
Sample I / D	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	17.03.2022

Total Weight of Sample: **5000** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Requirement as per MORTH table 500.17	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH
13.2	425	8.50	8.50	91.50	90 - 100	
9.5	480	9.60	18.10	81.90	70 - 88	
4.75	636	12.72	30.82	69.18	53 - 71	
2.36	682	13.64	44.46	55.54	42 - 58	
1.18	524	10.48	54.94	45.06	34 - 48	
0.600	540	10.80	65.74	34.26	26 - 38	
0.300	489	9.78	75.52	24.48	18 - 28	
0.150	356	7.12	82.64	17.36	12 - 20	
0.075	484	9.68	92.32	7.68	4 - 10	

Total Weight of Sample: **5000** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Requirement as per MORTH table 500.17	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH
13.2	419	8.38	8.38	91.62	90 - 100	
9.5	543	10.86	19.24	80.76	70 - 88	
4.75	680	13.60	32.84	67.16	53 - 71	
2.36	536	10.72	43.56	56.44	42 - 58	
1.18	552	11.04	54.60	45.40	34 - 48	
0.600	549	10.98	65.58	34.42	26 - 38	
0.300	682	13.64	79.22	20.78	18 - 28	
0.150	189	3.78	83.00	17.00	12 - 20	
0.075	475	9.50	92.50	7.50	4 - 10	

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Job No.: CACE/BBMP/CP/W.No.11/2021-22 Date: 17.03.222

Aggregate Impact Value

Client	**Assistant Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Sri. Chethan P,** Contractor, Bangalore.
Name of the Work	Pothole filling to Roads in Ward No.11 Kuvempunagara Vidyaranyapura Sub Division, BBMP, Bangalore.
BIS Code	IS 2386(Part 4):1963
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	17.03.222

Sl No.	Details	Test No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	380	382	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	84	86	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	296	296	
4	Aggregate Impact value = percent fines 100* (W_2/W_1) percent	22.11	22.51	**22.31**

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%(MORTH table no.500.16)

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Job No.: CACE/BBMP/CP/W.No.11/2021-22 Date: 17.03.2022

TEST REPORT

Client	:	**Assistant Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	:	**Sri. Chethan P,** Contractor, Bangalore.
Name of the work	:	Pothole filling to Roads in Ward No.11 Kuvempunagara Vidyaranyapura Sub Division, BBMP, Bangalore.
IS Code	:	IS 73:2013, IS 1203:1978(RA 2008), IS 1205:1978(RA 2009), IS 1208:1978(RA 2009), IS 1209:1978(RA 2009)
Source of location	:	Hot mix Plant, Bangalore, VG 30
Date of testing	:	17.03.2022

The results of the tests conducted on the bitumen sample using for Bituminous Concrete

Sl. No	Description	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 °C, 1/10 mm	49	Min 45
2	Softening point, °C	51	Min. 47
3	Ductility at 27°C, cm	>100	Min. 40
4	Flash Point, °C	288	Min. 220

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Job No.: CACE/BBMP/CP/W.No.11/2021-22 Date : 17.03.2022

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	**Assistant Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Sri. Chethan P,** Contractor, Bangalore.
Name of Work	Pothole filling to Roads in Ward No.11 Kuvempunagara Vidyaranyapura Sub Division, BBMP, Bangalore.
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Bituminous Concrete
Date of Testing	17.03.2022

Sl no	Test	1	2	Requirements as per MORTH 5th edition table no 500.16
1	Flakiness Index	11.9	12.6	Combined Flakiness & Elongation index Max 35%
2	Elongation Index	13.2	13.7	
	Combined Flakiness & Elongation index	25.10	26.30	

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Job No.: CACE/BBMP/CP/W.No.11/2021-22 Date : 19.03.2022

Specific Gravity And Water Absorption Test

Client	**Assistant Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Sri. Chethan P,** Contractor, Bangalore.
Name of the Work	Pothole filling to Roads in Ward No.11 Kuvempunagara Vidyaranyapura Sub Division, BBMP, Bangalore.
BIS Code	IS 2386(Part 3):1963
Type of Mix	Bituminous Concrete
Date of Testing	17.03.2022 to 19.03.2022

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2021	2023	2025	
2	Weight of basket suspended in water	W_2 g	755	755	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1266	1268	1270	
4	Weight of saturated surface dry aggregate in air	W_3 g	2017	2019	2021	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	751	751	751	
6	Weight of oven dried aggregate	W_4 g	2012	2013	2014	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.679	2.680	2.682	2.680
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.697	2.702	2.707	2.702
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.25%	0.30%	0.35%	0.30%

Comments:

→ Maximum allowable Aggregate Water absorption value for Bituminous Concrete is 2.0%(MORTH table 500.16)

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Job No.: CACE/BBMP/CP/W.No.11/2021-22 Date: 24.03.2022

TEST REPORT ON STABILITY OF MIX

Client	:	**Assistant Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	:	**Sri. Chethan P,** Contractor, Bangalore.
Name of the Work	:	Pothole filling to Roads in Ward No.11 Kuvempunagara Vidyaranyapura Sub Division, BBMP, Bangalore.
Source of location	:	Hot mix Plant, Bangalore
Type of Mix	:	Bituminous Concrete
Date of Testing	:	24.03.2022

The results of the tests conducted on the Bituminous Concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.36	10.52	9 Kn (min)
2	Marshal flow, mm	2.53	3.48	2 – 4
3	Percent air voids in Mineral Aggregate	13.69	14.85	13 – 15
4	Voids in Compacted Mix	3.28	4.12	3 – 6
5	Percent Voids filled with Bitumen	70.85	71.61	65 - 75
6	Density, g/cc	2.25	2.26	--

Note:

⇒ This test report shall not be reproduced except in full, without written approval of the laboratory.

⇒ The results indicated above are based on the tests carried out on the samples collected at the site.

⇒ Any Query regarding the report must be reported within 30 days from the date of testing.

AEE (VRP) SD

For CIVIL AIM CONSULTANTS & ENGINEERS

Authorised Signatory

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CIVIL AIM CONSULTANTS & ENGINEERS
(Building Geo-Tech & Highway Materials Testing Laboratory)

An ISO 9001-2015 Certified Company
NABL Accredited As Per ISO/IEC 17025:2017 Laboratory

Job No.: CACE/BBMP/CP/W.No.11/2021-22 Date : 24.03.2022

BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE

AASHTO T 164 & AASHTO T 30

CLIENT	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
AGENCY	Sri. Chethan P, Contractor, Bangalore.
NAME OF THE WORK	Pothole filling to Roads in Ward No.11 Kuvempunagara Vidyaranyapura Sub Division, BBMP, Bangalore.
SAMPLE ID	Hot Mix Plant, Bangalore
DATE OF TESTING	24.03.2022

BITUMEN CONTENT DETERMINATION

Description	Sample 1	Sample 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	472.5	472
3. Weight of Asphalt and Mineral matter Extracted, g	27.5	28
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g	-	-
6. Weight of Bitumen Extracted, g. (corrected)	27.5	28
7. Bitumen content in %	5.50	5.60
8. Average	5.55	

GRADATION AFTER EXTRACTION

SIEVE SIZE mm	Test 1 Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	Requirement as per MORTH table 500.17
19	0	0	0	100	100
13.2	14.2	14.2	3.0	97.0	90 - 100
9.5	65.8	80	16.9	83.1	70 - 88
4.75	90.3	170.3	36.0	64.0	53 - 71
2.36	43.2	213.5	45.2	54.8	42 - 58
1.18	35.9	249.4	52.8	47.2	34 - 48
0.600	55.4	304.8	64.5	35.5	26 - 38
0.300	43.9	348.7	73.8	26.2	18 - 28
0.150	36.5	385.2	81.5	18.5	12 - 20
0.075	45.6	430.8	91.2	8.8	4 - 10

SIEVE SIZE mm	Test 2 Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	Requirement as per MORTH table 500.17
19	0	0	0	100	100
13.2	13.2	13.2	2.8	97.2	90 - 100
9.5	63.8	77	16.3	83.7	70 - 88
4.75	92.4	169.4	35.9	64.1	53 - 71
2.36	46.3	215.7	45.7	54.3	42 - 58
1.18	45.8	261.5	55.4	44.6	34 - 48
0.600	52.3	313.8	66.5	33.5	26 - 38
0.300	46.3	360.1	76.3	23.7	18 - 28
0.150	38.2	398.3	84.4	15.6	12 - 20
0.075	42.1	440.4	93.3	6.7	4 - 10

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